Tourism Industry during a Pandemic

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Introduction

• COVID-19 in 2020 has caused a significant loss to the local economies that rely on the tourism industry.

• The tourism industry is a basic industry to local economies with low economic potential because it is a labor-intensive industry.
Popular tourist route

New Infected People Map, 28th July
Industries in Shizuoka Prefecture

Manufacturing area

Resort area
Aim of this study

• To provide the economic prediction for next month.
  • A standard tool to estimate the economic impact of tourism is an input-output analysis. Unfortunately, the estimation is yearly based.
  • System dynamics must contribute to the needs of residents.

• To develop the socio-economic model for prolonged coronavirus.
  • Consumers are changing their propensity to consume.
  • Employment structure is changing.
Background of this study

• The tourism industry in Shizuoka Prefecture faces a trade-off between infection control and tourist income.
  • Infection control:
    • All prefectures request self-quarantine to stop the spread of the coronavirus.
    • The number of positives for the coronavirus in Shizuoka Prefecture correlates with the number of positives in Tokyo.
  • Tourist income:
    • A decline in sales.
    • Closing of restaurant and hotel business.
    • Dis-employment.

No first-time customers
Visitors to Shizuoka Prefecture

![Graph showing visitor numbers from 2019 to 2020. The graph indicates a peak in August 2019 and a significant drop in 2020.](image-url)
Model for Shizuoka Prefecture

Input-output analysis

Tourism demand → Regional GDP

Tourists

New cases of COVID-19

Input-output multiplier

Business suspension

Monthly data of guests

High correlation

New positives for the corona virus
Input-output analysis of tourism

\[
X = \left[ I - (I - \hat{M})A \right]^{-1} (I - M_0)F
\]

- Outputs
- Technical coefficient matrix using TSA
- Tourism consumption
- Leontief inverse
- Self-sufficient ratios

TSA: Tourism Satellite Account
Input-output part of the model

- Number of tourists in 2019
- Number of tourists in 2020
- Travel consumption
- Leontief inverse table
- Self-sufficiency table
- Employment ratio
- Local employment
- Direct+indirect impact
Result 1: Economic ripple effect

- The ripple effect on Shizuoka’s economy due to tourism consumption was estimated to be ¥393 billion yen in 2020, 63% of ¥626 billion yen in 2019.
- The model revealed that the loss at a peak season (summer season) was significant in 2020.
Result 2: Employment effect

• The employment effect on Shizuoka’s economy due to tourism consumption was estimated to be 39,708 persons in 2020, which was 63% of 63,299 persons in 2019.
Conclusion

• 1) An input-out problem can be inverted into an equivalent system dynamics model. In system dynamics format, we can visualize processes that are not visible in the static model.

• 2) The system dynamics model with TSA clarifies the severity of the tourism industry in detail. For example, despite the “Go-To Travel” campaign, the decrease in tourists during the busy summer season damaged the tourism industry in Shizuoka Prefecture during the pandemic.

• 3) There are many deficiencies in regional economic data. The system dynamics model may reproduce the problem even in situations where limited data is available.

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Future work

• 1) The current model uses a 47x47 technical coefficient matrix. I am now updating it to the full 109x109 matrix.

• 2) A half of visitors in the Shizuoka Prefecture stay in the Izu Peninsula. Therefore, I am now making the Izu model.

• 3) The mudslide attacked Atami City in Shizuoka Prefecture on the 3rd July 2021. Atami city is a gate to the Izu Peninsula. This giant mudslide delays the recovery of tourism. I will add this effect.